

**Final VELCO Operating Committee
MINUTES**

November 17, 2016, 11 a.m. – 3:00 p.m.
GMP Montpelier Office

Participating members: Frank Etori (VELCO), James Gibbons (Burlington Electric Department), Craig Myotte (VT Public Power Supply Authority/ Morrisville Power & Light), Jason Pew (VELCO), Bill Powell (Washington Electric Cooperative), Chris Root (VELCO), and Ken Tripp (Vermont Electric Cooperative), Ken Couture (GMP)

Other participants: Mike Burke (Green Mountain Power), Deena Frankel (VELCO) by phone, John Honker (Magellan Advisors), Kerrick Johnson (VELCO), Phil Kearney (VELCO), Nick Lisai (VELCO), Mike Loucy (VELCO), Dan Nelson (VELCO), and Robert D’Arienzo (VELCO)

<p style="text-align:center">Next Meeting <u>TENTATIVE</u></p> <p style="text-align:center">December 15, 2016</p> <p style="text-align:center">11 a.m. to 3 p.m.</p> <p style="text-align:center">GMP Montpelier</p> <p style="text-align:center">1-866-720-4556</p> <p style="text-align:center">Code: 6027065</p>

Opening

- Mr. Root called the Operating Committee (OC) meeting to order at 11:05 a.m.
- The agenda was adjusted to allow Mr. Honker to present the fiber optic market analysis first, allowing him to travel earlier.
- Mr. Root requested Mr. D’Arienzo to provide a quick weather outlook covering the impending winter weather event anticipated over the weekend.

Safety Topic

- Mr. Kearney discussed winter weather driving. The first winter storm of the season is approaching, tire change-overs will be abundant and wait times will likely be long; don’t wait until the last minute if you can help it. The group went around the room and offered something in their car they value specifically for winter preparedness. Items included: jumper cables, blankets, food, water, ice scrapers, kitty-litter or sand for traction on ice.

Weather update (added to agenda)

- Mr. D’Arienzo reported on the weather anticipated over the weekend.
- Mr. Johnson requested Mr. D’Arienzo report to the group on the Killington/World Cup race preparation work that VWAC is assisting. As the Deep Thunder forecast provides a granularity that exceeds Killington’s current forecasting abilities, two point forecasts were added to the portal, one specific for the race trail, and access was provided to Killington personnel to assist with snowmaking for the event.
- Mr. Root inquired about the World Cup preparations by GMP and offered VELCO’s assistance in any preparations should it be required. Mr. Burke reported IR testing occurs pre-season for Killington every year in preparation for the upcoming season. Mr. Root reported that added inspections for the VELCO substations supplying the Killington area sub-transmission would be performed.

Minutes Approval

- Mr. Myotte moved approval of the minutes as posted, Ken Couture seconded and the minutes were approved without objection.
- It was noted by Mr. Root that, as written in the OC bylaws, VELCO representatives have no vote on any OC business other than cost allocation determinations, in which case collectively VELCO shall have one vote.

Fiber Market Analysis and next steps

- Mr. Nelson introduced Mr. Honker, President and C.E.O. of Magellan Advisors, who has been analyzing VELCO's fiber assets for the purpose of maximizing their value for VELCO and its owners.
- Mr. Root reported that National Grid is looking at VELCO's infrastructure and operations to see how VELCO's telecommunication network has been built, utilized, and operated. They have identified a significant reoccurring monthly cost for public telecommunication services throughout their transmission system that could be reduced with an in-house solution similar to VELCO's.
- Mr. Nelson and Mr. Honker reviewed and discussed the presentation materials provided.
 - The VELCO fiber consists of over 1800 miles of lines that have delivered a value estimate of \$19M in in avoided costs to VELCO and the DUs for operational and corporate purposes. Assets are currently being used for VELCO and Vermont Distribution Utilities (VDU) operational and corporate voice/data transport services.
 - The Magellan Advisors performed a market assessment of the fiber assets and included the following:
 - Existing wholesale and large population markets in VT are already well served by the major providers in the state
 - Many rural markets (small communities that include municipal DUs, schools, hospitals, government, employers, etc.) are underserved. The VELCO network reaches many of these markets and could be an area for expansion with or without collaborative partnerships with external entities.
 - The next steps following the assessment will be a continuation of the DU engagement and associated feasibility studies of identified expansion and/or partnerships.
- Mr. Honker reported that roughly five hundred municipal and cooperative electric service providers (co-op) across the country are offering broadband to their customers. Broadband is being offered as part of the traditional suite of municipal services (water, sewer, and electric) or as an additional service of the co-ops in rural areas.

Several financial models that include Rural Utilities Service (RUS) funds, partnerships with an existing service provider or other independent options could be developed to meet any number of collaborative efforts.

VELCO's infrastructure, in combination with the need for rural broadband throughout Vermont, provides for similar opportunities. Some examples were provided as to what an approach like this could look like:

- An electric utility could provide the “last-mile” of infrastructure to customers and partner with an existing telecommunications company to provide the service.
- A telecommunications company could build local infrastructure in a community and partner with the electric utility to provide backhaul service to an established communications hub.

He further reported that municipal, co-op, transmission, and investor-owned utilities are providing this service to their customers in a cost effective manner due in part to the fact that they have existing crews familiar with similar types of construction, emergency response, and maintenance.

- Mr. Burke reported that a portion of GMP’s backhaul is done via existing telecommunication providers in the state and that he could see the potential value in utilizing existing VELCO fiber assets.
- Mr. Tripp commented that third party fiber is currently available in many VEC areas however the most cost effective way of providing a secure network is the ultimate goal. In some cases wireless technology has proven to be the best solution.
- Mr. Johnson reported that Mr. Nelson and Ms. Coombs have been reaching out to the VDUs to provide a full portfolio of VELCO services (fiber, data, weather services, etc.) that could be utilized by the VDUs.
- Mr. Loucy described an example of how a fiber optic network in northern Georgia positively impacted local education. In a rural GA area an electric distribution utility service provider had expanded into telecommunications services whereby those services have been utilized by a number of public schools to increase their respective course offerings. Specifically, rural schools can now offer virtual classroom instruction, referred to as remote learning, potentially reducing school costs by sharing teaching resources.
- Mr. Johnson reported that a clear understanding of the cost allocations among the DUs and VELCO would need to be determined as part of any proposed projects.
- Mr. Loucy reported VELCO is not attempting to become a direct competitor with any existing services. The work being done is to pursue feasible partnerships in currently underserved rural areas. He further stated that VELCO is looking to establish further discussions with any interested VDU and would reach out to schedule meetings as appropriate.

Roles and Responsibilities of the OC

- Mr. Root reviewed and discussed the roles and responsibilities of the Operating Committee as outlined in *The Vermont Transco Transmission Administration Manual (V-TAM)* and summarized in the presentation provided.
- Mr. Root reviewed the process to update participating members per the Operating Committee (OpCom) Bylaws. The following appointments for members were accepted as follows:
 - Christine Hallquist of VEC appointed, via written notification, Mr. Tripp as the VEC primary member with Kris Smith serving as the alternate
 - Neale Lunderville of BED appointed, via written notification, James Gibbons as the BED primary member with Munir Kasti serving as the alternate
 - Mr. Root of VELCO appointed Mr. Pew as the third VELCO member, and Mr. Pew was designated as the OpCom Secretary
- Mr. Root highlighted some of the responsibilities of the group as outlined in the V-TAM:
 - Address and cultivate the “Team-Vermont” relationships
 - Determining cost allocations
 - Facilitating the exchange of information among Vermont entities
- Mr. Root noted the following with regard to OpCom voting:
 - VELCO members only have the authority to vote on cost allocation determinations and shall collectively have a single vote. VELCO has no voting authority in other matters.
 - Participating members, or their respective alternate, each get a single vote.
- Ms. Frankel reported that meeting materials are available on the OpCom website. With the exception of CEII information, which requires an OpCom log-in, all meeting materials are public information. It was noted that this type of transparency of OpCom business was desired. Ms. Frankel further identified the website and provided a brief overview of its content.
- Mr. Gibbons questioned if all members had a signed CEII agreement. Mr. Root reported he would follow up with VELCO Legal.
- Mr. Gibbons discussed the 11:00 a.m. start time with the group and questioned if it should be moved earlier in the morning. The group decided that the 11:00 a.m. would remain to allow for Operations personnel have an opportunity to set up crews for the day prior to the meeting.

Squirrel protection in substations

- Mr. Root introduced the topic by identifying the risk of small animal contact on lower voltage facilities. He stated that VELCO’s 115kV and above assets are generally not an issue as clearances inherent of those voltage levels provide ample protection. VELCO has six substations with lower voltage (12.75 kV / 13.8 kV) equipment. These assets are the areas of identified concern and he was looking for input from the DUs on best practices to avoid animal problems at distribution voltages.
- Mr. Lisai presented VELCO’s current protection that provides protection by means of increasing the distance between the energized equipment and ground or grounded elements.

- Mr. Burke and Mr. Couture presented a selection of GMP's small animal contact events, their current means of protecting and ongoing enhancements for GMP's lower voltage assets.
 - Approximately 14% of GMP outage events were caused by animal contact, third behind tree contact and equipment issues. Animal contacts events increase in the summer and generally occur in the early morning hours.
 - GMP investigated several small animal protections before settling on TransGard substation fencing. TransGard is essentially an electrified fence, similar to a cattle fence that wards off small animals before they can get to energized equipment from ground level. Additionally, Jump Barriers and Line Spinners on conductors entering a facility protect equipment from animals that would normally gain access via the conductors.
 - Mr. Burke noted that evidence of potential theft being deterred at locations where the TransGard fencing system has been deployed has been recognized.
 - Currently GMP has 40 locations with a combination of ground and conductor protection in place. Generally, these systems are being implemented at new and upgraded facilities or shortly after an animal contact event.
 - GMP has also used Greenjacket cover-up in areas where customers with high power quality are located. This type of protection is more expensive but provides significant protection by means of custom designed cover installed on energized equipment. Mr. Burke reported that in one facility where Greenjacket is installed, an adjacent VELCO 34.5 kv breaker had no protection.
- Mr. Tripp reported that the recently upgraded Newport substation has similar protections in place. He inquired about using hard guard around structures to prevent animals climbing structures to access nests. VELCO and GMP reported using metal flashing to wrap structures for this type of protection.
- Mr. Root asked the group to consider what VELCO should do to protect against small animal contacts in the lower voltage substations.
 - Mr. Burke requested that the earlier identified station where GMP assets are protected using Greenjacket 34.5 kV equipment be investigated further to protect the VELCO assets in the same manner as the GMP assets in the same station.
 - Mr. Gibbons requested that a short proposal for each substation be presented to the respective VDU substation engineers for approval and/or comment on the design. Mr. Root agreed; VELCO will provide a proposal to the effected entities with low voltage connections for review.

Sharing of Public safety Issues

- Mr. Kearney continued last month's discussion concerning public outreach with regard to the electrical safety. He stated he was still looking to gather outreach materials from the membership.
- Mr. Kearney reported that the Vermont Energy Education Program (VEEP) visited VELCO to provide a pre-view and solicit feedback from industry experts on the lesson(s) being developed by the group. Mr. Johnson and Mr. Kearney saw the opportunity to interject a public safety message into the lesson(s) being developed as a good fit and very beneficial toward the education of safety. Mr. Burke reported GMP had a similar

exchange of information and he also noted the addition of a safety message to the lesson(s) should be pursued.

- Mr. Root mentioned EEI has some public outreach material that could be pursued. He further proposed that the development and distribution of a public safety message throughout Vermont be a goal of the group.
- Mr. Tripp discussed taking the message to regional events such as county fairs and other public events.

VWAC Module

- Mr. D'Arienzo presented the materials provided that included the following:
 - Visualization enhancements for VWAC output are being accomplished through the development of Weather InSights Environment (WISE). WISE provides a single platform for displaying forecasts over improved maps and geospatial information. This development will allow for visualization down to the 1km grid forecast being produced.
 - An Ice Accretion forecast is being developed to assist with potential damage impact forecasts. The accretion forecast is contingent on an accurate precipitation type forecast that differentiates between rain, snow, sleet, and freezing rain. That precipitation type forecast has been deployed via the VWAC portal and is currently being verified. Further development of the Ice Accretion forecast will continue with the possibility of creating an outage prediction model based upon historical weather and outage data.
 - Instrumentation (weather stations) gaps and potential locations for new instruments have been identified. New instruments have been proposed for existing State-wide radio sites (5) and existing substations (7). Additional stations are anticipated to be ordered and installed within the first two quarters of 2017.
 - Vermont Citizen Science Program is a program that allows for the general public to participate in the helping to improve weather forecasts. Significant gaps in the weather observations exist; providing actual observations via this program would assist in the validation and tuning of weather models. The program is based on the Community Collaborative Rain, Hail, and Snow Network. A non-profit network of volunteers who observe and post daily measurements to the internet. This is valuable because Deep Thunder provides approximately 12,000+ forecasts and VT has approximately 150 active weather stations to use for validation and subsequent tuning of those forecasts.
 - An Ice Accretion station is being constructed that will be installed at VELCO's Wenlock facility in Ferdinand, VT. The station will be approximately 20-30 feet long and consist of three different de-energized conductors, one static wire, and one fiber optic line for the purpose of validating and tuning the Ice Accretion forecasts. Mr. Gibbons inquired about the difference in the model versus real time due to the fact that the conductors would not be energized and thus there would be a temperature differential. The temperature difference was discussed during the project's inception; ultimately having a benchmark would be a valuable first step.

- A proposal to create a verification of VWAC output is currently being developed in conjunction with MacroSoft. The proposed verification can be used to compare weather models as well as identify areas or weather events that may require model tuning.
- Mr. Burke inquired about alert notifications from the DT forecast. Mr. D'Arienzo reported that the alert system is available via the portal.

Transmission Connected Interconnection Projects

- Mr. Etori gave a detailed CEII presentation on active interconnection projects proposed on VELCO assets.

1547 IEEE Standard Update

- Mr. Root reviewed the meeting materials provided. A few examples of the changes in the updated standard include voltage and frequency ride-through specifications, anti-islanding protection, and distribution feeder fault detection that will have an impact on the interconnected power system.
- Mr. Root reported that IEEE should vote in February to approve of the draft standard with an anticipated late winter of 2017 release.
- Mr. Root further reported that due to the changes to the standard, he is organizing an IEEE 1547 meeting that will include training on the scope and purpose of the latest revision with special consideration for the distribution and transmission utility protection engineers.

Open Discussion

- The OpCom by-laws allow for bi-monthly (every other month) meetings. The December meeting was discussed with the tentative date set for 12/15/2016. If the agenda is not full and Participating Members agree, the December 2016 meeting could be postponed until January 2017. Mr. Root will follow-up with the group outside of this meeting and facilitate the decision.
- Suggested next meeting agenda items
 - VWAC High-Performance Computing Cluster (HPCC) update
 - Priority phone services: Government Emergency Telecommunications Service (GETS) and Wireless Priority Service (WPS) programs

Motion to adjourn

- Mr. Myotte moved and Mr. Tripp seconded adjournment, which was agreed without objection at 15:01 p.m.